

# [FLIP-CHIP DIE AND FLIP-CHIP PACKAGE SUBSTRATE]

## Abstract

A flip-chip die and a flip-chip package substrate. The flip-chip die has an active surface containing a plurality of core power/ground pads, at least one signal pad rings, at least one power pad rings and at least one ground pad rings. The core power/ground pads are located in the central region of the die while the die pad rings are arranged concentrically just outside the central power/ground pad occupied region. The uppermost layer of the flip-chip package substrate has a plurality of bump pads that correspond to the die pads on the die. Non-signal bump pad rings may also form outside the signal bump pad ring. Pairs of power trace or ground trace may also form on the sides of a signal trace in any one of the wiring layers within the flip-chip package substrate to serve as guard traces for the signal trace.